August 15, 1988

CD-88-10 (HDE/HDV)

Dear Manufacturer:

SUBJECT: Computerized Processing of Heavy-Duty Engine and Heavy-Duty Vehicle Certification Data

We have developed a computerized system for processing heavy-duty engine and heavy-duty vehicle certification data. The use of this system will provide a number of significant advantages. For example:

1. Interaction between EPA and manufacturers will be expedited.

2. Computer generated output reports will provide manufacturers with a ready means for ensuring that data in the EPA data base are correct.

3. A short cut data submission procedure will provide manufacturers with a simple means for revising or updating previously submitted data.

4. A year-to-date summary of emission test results will be automatically updated each time new data are added.

5. The accumulation of certification data in the EPA computer data base will facilitate statistical analyses by manufacturers, EPA, and other interested parties.

The new system is based on the use of personal computers for processing the following four different categories of certification data:

Diesel heavy-duty engine (DHDE)

Gasoline-fueled heavy-duty engine (GHDE)

Gasoline-fueled heavy-duty vehicle (GHDV)

Heavy-duty vehicle certification to light-duty truck emission standards (LHDV)

For each certification category (i.e., DHDE, GHDE, GHDV, and LHDV), two different entry forms, which are unique for the category, are used for the submission of data. A "Family Information" form is used to provide information which identifies and characterizes a particular engine family. A "Test Information" form is used for each tested model or calibration in the family to provide information which confirms compliance with the applicable emission standards. Under this approach, family information will not have to be resubmitted every time test results are submitted as was done when the old combined family data/test results forms were used.

The computerized system is being implemented immediately in a fairly basic form and will be subsequently modified to enhance its usefulness for future model year programs. For example, optional electronic transmission procedures for submitting data and obtaining output reports will be added.

We encourage you to begin using the new data input forms as soon as possible for any 1989 and later model year certification data. We believe their use will be to your advantage. If you have already submitted some 1989 model year certification data on the old previously used forms, we would appreciate your resubmission of the data on the new forms. Such resubmission will be very helpful to us in making a clean changeover to the new system. We believe it will be helpful to you in that it will expedite your review of the annual test results summary, and possibly, eliminate the need for making any corrections or additions.

The use of the new standardized data entry forms for submitting heavy-duty engine and heavy-duty vehicle certification information is described in detail in the enclosed document, "Use of the EPA Computerized System for Processing Heavy-Duty Engine and Heavy-Duty Vehicle Certification Data." If you have any questions after reviewing these instructions, please contact Mr. T. Snyder at (313) 668-4376 or Mr. J. Bozek at (313) 668-4292. If you believe a workshop for providing explanations regarding the new computerized system would be useful, please let us know as soon as possible. If there is interest in such a workshop, we will schedule it for the afternoon of September 21, 1988, following the next EPA/Industry bimonthly meeting.

Sincerely,

Robert E. Maxwell, Director
Certification Division
Office of Mobile Sources

Enclosure

8015b

USE OF THE EPA COMPUTERIZED SYSTEM FOR PROCESSING HEAVY-DUTY ENGINE AND HEAVY-DUTY VEHICLE CERTIFICATION DATA

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF MOBILE SOURCES
CERTIFICATION DIVISION
2565 PLYMOUTH ROAD
ANN ARBOR, MICHIGAN 48105
(313) 668-4200

Issue Date: July 25, 1988

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CHAPTER 1 -INTRODUCTION

Heavy-Duty Computer Data Base Details

A new computerized system has been established for storing and processing heavy-duty engine and heavy-duty vehicle certification information. The effective use of the system involves the following manufacturer actions and resultant EPA reactions:

1. The manufacturer uses standardized hard copy data entry forms to provide new information, or revised information, regarding (a) the initial certification of an engine family or (b) the subsequent implementation of a running change applicable to that family.

2. EPA enters the submitted information into the computer data base to generate output reports which are forwarded to the submitting manufacturer for confirmation.

3. The manufacturer confirms the accuracy of the reported information, or if revisions are necessary, submits new data entry forms with the correct information.

4. EPA reviews the confirmed reports, and if all certification requirements are satisfied, uses the computer to (a) generate the requested certificate of conformity, or (b) document the implementation of the reported running change.

The information in the computer data base is subdivided into the following certification categories:

Diesel heavy-duty engine (DHDE)

Gasoline-fueled heavy-duty engine (GHDE)

Gasoline-fueled heavy-duty vehicle (GHDV)

Heavy-duty vehicle certified in accordance with the light-duty truck provisions (LHDV)

Data Entry Form Details

The Certification Information Sheets (CIS)

The hard copy data entry forms which the manufacturer uses for the submission of certification information are called "Certification Information Sheets" (CIS).

Spaces are provided on the CIS for each item of required information. Each space is subdivided into individual blocks in which the applicable letters and/or numbers can be entered. When more blocks are provided than are needed for a specific item of information, any group of sequential blocks can be used without regard to whether the entry of data is started to the left or the right of the allotted space. The actual entry of the information can be accomplished by any means which provides adequate legibility.

A separate and distinct CIS is used for each certification category: DHDE, GHDE, GHDV, and LHDV. In each category, the same type of CIS is used for (a) providing new information, or (b) revising information which is already in the data base. When a CIS is used to revise previously submitted information, entries are needed only in connection with (a) the identifying blocks at the top of the form and (b) the specific data blocks that are applicable to the items of information which require revision.

Regardless of the certification category, two different types of CIS are used: the "Family Information Sheet" and the "Test Information Sheet." When a GHDV is being certified, a third type of CIS, the "Evaporative Family/Engine Family Comparison Information" sheet is required.

The Family Information Sheet

One Family Information CIS is submitted for each engine family to provide information which identifies and characterizes the the subject engine family. The specific

items of information which are entered on the family CIS include:

The manufacturer's corporate name

The manufacturer's designation for the engine family

The EPA standardized name for the family

The specified physical characteristics of the family

The Test Information Sheet

One Test Information sheet is submitted for each tested model or calibration to provide information which confirms compliance with the applicable emission standards. The specific items of information which are entered on the test CIS include:

The engine family name

The identification of the model or calibration

The identification of the test engine or vehicle

The emission test results

Detailed instructions regarding the use of the DHDE, GHDE, GHDV, and LHDV family and test information sheets are presented in the Chapters 2 through 5 of these instructions.

Output Report Details

The generation of an output report is automatically triggered by the EPA computerized data handling system when the certification information which a manufacturer provides by submitting a completed family or test CIS is entered into the

data base.

This report will not be accurate if errors were made when the CIS was completed or when the information provided was entered into the computer data base.

Some of the resultant errors in the report will be obvious because they are outside of the acceptable ranges. In such cases, warning notes will be automatically added to the report. Other kinds of report errors will be apparent only to the manufacturer who submitted the information on the CIS.

To ensure that all types of report errors are corrected, all computer generated reports are forwarded to the submitting manufacturer for verification, and if necessary, for revision by the submission of correcting CIS forms.

CHAPTER 2
DIESEL HEAVY-DUTY ENGINE DATA FORMS

Family Information

Field	Description	Instructions
K01	Form	This entry has been completed.
K02	Process Code	Enter "N" -new submission or "C" - correction.
K03	EPA Engine Family	Enter the EPA standardized engine family name.
K04	Manufacturer Engine Family	Only enter the manufacturer engine family name when it differs from the EPA standardized engine family name.
K05	Corporate Name	Enter corporate name as it will appear on the certificate of conformity.

K06	Number of Cylinders	Enter the number of engine cylinders.
K07	Displacement(s)	Enter the engine displacement: if more than one displacement in a family, enter the largest displacement first starting at the left. Displacements in cubic inches are entered to the nearest whole cubic inch and displacements in liters are entered to the nearest tenth of a liter. The decimal point must be included when entering displacement in liters.
K08	Fuel System Type	Enter "M" -mechanical controlled fuel injection systems and "E" - electronic controlled fuel injection systems.

Field	Description	Instructions
K09	Method of Aspiration	Enter "N" -natural aspirated engines, "T" -turbo-charged engines, "TAW" -turbo-charged engines using water-to-air after-coolers, and "TAA" -turbo-charged engine using air-to-air after-coolers.
K10	Family Sales	Enter the engine family projected sales for the model year.
K11	Intended Service Class	Enter "L" -light heavy-duty (110,000 miles), "M" -medium heavy-duty (185,000 miles), and "H" -heavy heavy-duty (290,000 miles).
K12	Useful Life	This field is to be completed only

	Mileage	when the engines useful life mileage is different than the intended service class mileage.
K13	Nonconformance Penalty (NCP)	Enter "Y" -yes, when using a particulate NCP and "N" -no, when a particulate NCP is not used.
K14	Deterioration Factor Type (Gaseous Only)	Enter "A" -additive deterioration factor is being used and "M" -multiplicative deterioration factor is being used.
K15	Family Models	Enter the engine model(s) contained in the engine family. If more than one model, separate each model name with a semicolon (;).

Correcting The Family Information

When correcting or adding information to the family information sheet the first three fields (K01, K02, and K03) must be entered along with the field(s) being corrected or added. The complete field must be entered each time a correction or addition is made.

Test Information

Field	Description	Instructions
K101	Form	This entry has been completed.
K102	Process Code	Enter "N" -new submission or "C" -

		a correction.
K103	EPA Engine Family	Enter the EPA standardized engine family name.
K104	Data Set Number	The data set number is assigned by the manufacturer. This number is used to identify the test information submitted within an engine family and must have a different number assigned to each set of test information submitted.
K105	Engine Model	Enter the model the test engine represents.
K106	Displacement	Enter the test engine displacement in cubic inches or liters. Displacements in cubic inches are entered to the nearest whole cubic inch and displacements in liters are entered to the nearest tenth of a liter. The decimal point must be included when entering displacement in liters.
K107	Engine I.D. Number	Enter the test engine identification number.
K108	Emission Control System	Enter the types of emission control system the test engine represent. Use "EM" -engine modification, "EGR" -exhaust gas recirculation, "TR" - trap oxidizer, and "CAT" -catalytic converter, etc. Start at the left and enter all emission control systems. If additional control system identifications are needed please contact EPA.

Field	Description	Instructions

K109	Engine Code	Enter the test engine code (calibration).
K110	CO Waiver	Enter "Y" -yes when the carbon monoxide data are not reported and "N" -no when the carbon monoxide data is reported.
K111	Rated HP at Engine RPM	Enter starting at the left the rated horsepower and the revolutions per minute the rated horsepower occurs.
K112	Rated Torque at Engine RPM	Enter starting at the left the rated torque in foot pounds and the revolutions per minute the rated torque occurs.
K113	Test Type	Enter "C" -cold start, when the test data includes cold start data and "H" -hot start, when the test data does not include cold start data.
K114	Data Type	Enter "C" -certification test data and/or "R" -running change test data.

Fields K115 through K135 are for OFFICIAL TEST RESULTS, DETERIORATION FACTORS, and CERTIFICATION LEVELS

OFFICIAL TEST RESULTS shall be reported to the number of decimal places contained in the applicable emission standards expressed to one additional significant figure. (Ref: 40 CFR 86.084-26(d)(2)(ii))

DETERIORATION FACTORS "Additive" shall be reported to the same number of decimal places as the official test results. "Multiplicative" shall be reported to three places to the right of the decimal point.

CERTIFICATION LEVELS to compare with the emission standards shall be reported to the same number of significant figures as contained in the applicable standards. (Ref: 40 CFR 86.088-28(c)(4)(iv))

Correcting The Test Information

When correcting or adding information to the test information sheet the first four fields (K101, K102, K103 and K104) must be entered along with the field(s) being corrected or added. The complete field must be entered each time a correction or addition is made.

CHAPTER 3
GASOLINE-FUELED HEAVY-DUTY ENGINE DATA FORMS

Family Information

Field	Description	Instructions
K01	Form	This entry has been completed.
K02	Process Code	Enter "N" -new submission or "C" - a correction.
K03	EPA Engine Family	Enter the EPA standardized engine family name.
K04	Manufacturer Engine Family	Only enter the manufacturer engine family name when it differs from the EPA standardized engine family name.
K05	Corporate Name	Enter corporate name as it will appear on the certificate of conformity.
K06	Number of Cylinders	Enter the number of engine cylinders.
K07	Displacement(s)	Enter the engine displacement: if more than one displacement in a family, enter the largest displacement first starting at the left. Displacements in cubic inches are entered to the nearest whole cubic inch and displacements in liters are entered to the nearest tenth of a liter. The decimal point must be included when entering displacement in liters.
K08	Fuel System Type	Enter "C" -carburetor and "F" -

		fuel injection systems.
K09	Method of Aspiration	Enter "N" -natural aspirated engines, and "T" -turbo-charged engines.

Field	Description	Instructions
K10	Family Sales	Enter the engine family projected sales for the model year.
K11	Engine Intended Vehicle Usage	Enter "A" -engines that meet 40 CFR 86.088-1O(a)(1)(i), "G" -engines used in vehicles with GVWR greater than 14, 000 lbs and meet 40 CFR 86.088-10 (a)(1)(ii), "C" -Combine use of "G" and "5", "5" -engines that use the 5% option 40 CFR 86.088-1O(a)(3)(i), or "N" -engines that use NCP 40 CFR Subpart L.
K12	NCP	This field is to be completed only when NCP is used. Enter "Y" -yes, when using a CO or HC NCP and "N" - no, when an NCP is not used.
K13	Deterioration Factor Type	Enter "A" -additive deterioration factor is being used and "M" - multiplicative deterioration factor is being used.
K14	Family Models	Enter the engine model(s) contained in the engine family. If more than one model, separate each model name with a semicolon (;).

Correcting The Family Information

When correcting or adding information to the family

information sheet the first three fields (K01, K02, and K03) must be entered along with the field(s) being corrected or added. The complete field must be entered each time a correction or addition is made.

Test Information

Field	Description	Instructions
K101	Form	This entry has been completed.
K102	Process Code	Enter "N" -new submission or "C" -correction.
K103	EPA Engine Family	Enter the EPA standardized engine family name.
K104	Data Set Number	The data set number is assigned by the manufacturer. This number is used to identify the test information submitted within an engine family and must have a different number assigned to each set of test information submitted.
K105	Engine Model	Enter the model the test engine represents.

K106	Displacement	Enter the test engine displacement in cubic inches or liters. Displacements in cubic inches are entered to the nearest whole cubic inch and displacements in liters are entered to the nearest tenth of a liter. The decimal point must be included when entering displacement in liters.
K107	Engine I.D. Number	Enter the test engine identification number.
K108	Emission Control System	Enter the types of emission control system the test engine represent. Use "EM" -engine modification, "EGR" -exhaust gas recirculation, "AIR" -air injection, and "CAT" - catalytic converter, etc. Start at the left and enter all emission control systems. If additional control system identifications are needed please contact EPA.

Field	Description	Instructions
K109	Engine Code	Enter the test engine code (calibration).
K110	Number Carburetors-Venturies	This field is to be completed only when the engine is carbureted. Starting at the left enter the number of carburetor(s) used on the engine and the number of venturies each carburetor has.
K111	Rated HP at Engine RPM	Enter starting at the left the rated horsepower and the revolutions per minute the rated horsepower occurs.

K112	Rated Torque at Engine RPM	Enter starting at the left the rated torque in foot pounds and the revolutions per minute the rated torque occurs.
K113	Data Type	Enter "C" -certification test data and "R" -running change test data.

Records K114 through K125 are for OFFICIAL TEST RESULTS, DETERIORATION FACTORS, and CERTIFICATION LEVELS

OFFICIAL TEST RESULTS shall be reported to the number of decimal places contained in the applicable emission standards expressed to one additional significant figure. (Ref: 40 CFR 86.084-26(d)(2)(ii))

DETERIORATION FACTORS "Additive" shall be reported to the same number of decimal places as the official test results. "Multiplicative" shall be reported to three places to the right of the decimal point.

CERTIFICATION LEVELS to compare with the emission standards shall be reported to the same number of significant figures as contained in the applicable standards. (Ref: 40 CFR 86.088-28(c)(4)(iv))

Correcting The Test Information

When correcting or adding information to the test information sheet the first four fields (K101, K102, K103 and K104) must be entered along with the field(s) being corrected or added. The complete field must be entered each time a correction or addition is made.

CHAPTER 4

GASOLINE-FUELED HEAVY-DUTY VEHICLE EVAPORATIVE DATA FORMS

Family Information

Field	Description	Instructions
K01	Form	This entry has been completed.
K02	Process Code	Enter "N" -new submission or "C" -a correction.
K03	EPA Evaporative Family	Enter the EPA standardized evaporative family name.
K04	Manufacturer Evaporative Family	Only enter the manufacturer evaporative family name when it differs from the EPA standardized evaportive family name.
K05	Corporate Name	Enter corporate name as it will appear on the certificate of conformity.
K06	Family Sales	Enter the evaporative family projected sales for the model year.
K07	Family Models	Enter the vehicle model(s) contained in the evaporative family. If more the one model, separate each model name with a semicolon (;).

Test Information

Field Description	Instructions
K101 Form	This entry has been completed.

Field Description	Instructions
K102 Process Code	Enter "N" -new submission or "C" - a correction.
K103 EPA Evaporative Family	Enter the EPA standardized evapora tive family name.
K104 Data Set Number	The data set number is assigned by the manufacturer. This number is used to identify the test infor mation submitted within an engine family and must have a different number assigned to each set of test information submitted.
K105 Emission Control System	Enter the types of emission control system the test data represent. Use "CRC" for crankcase storage, "CAN" for charcoal canister, "CAC" for charcoal air cleaner. Start at the left and enter all emission control systems. If additional control system identifications are needed please contact EPA.
K106 Data Type	Enter "C" -certification test data and "R" -running change test data.
K107 Evaporative System Intended Usage	Enter "L" -systems used in vehicles 14,000 lbs GVWR or less and "G" - systems used in vehicles greater than 14,000 lbs GVWR.

K108 Deterioration Factor	Enter the emission control system deterioration factor to a minimum of two places to the right of the decimal.

Fields K109 through K118 are divided into two groups of information: (1) Evaporative Family Information, and (2) Engine Family Information. The evaporative family information has only one column: code (calibration). The engine family information is divided into four columns: (1) manufacturer, (2) family, (3) control system, and (4) code. All columns of

information may not need completing, only enough information to tie vehicle evaporative system to the engine system. There may be only one evaporative family married with one engine family. In another case it might be necessary to complete all the information (i.e. evaporative code married to particular engine code).

Correcting The Test Information

When correcting or adding information to the test information sheet the first four fields (K101, K102, K103 and K104) must be entered along with the field(s) being corrected or added. The complete field must be entered each time a correction or addition is made.

CHAPTER 5

GASOLINE-FUELED HEAVY-DUTY VEHICLE
40 CFR 86.085-1(b) OPTION FORMS

Family Information

Field	Description	Instructions
K01	Form	This entry has been completed.
K02	Process Code	Enter "N" -new submission or "C" -a correction.
K03	EPA Engine Family	Enter the EPA standardized engine family name.
K04	Manufacturer Engine Family	Only enter the manufacturer engine family name when it differs from the EPA standardized engine family name.
K05	Manufacturer Evaporative Family(ies)	Enter the manufacturers evaporative family name(s).
K06	Corporate Name	Enter corporate name as it will appear on the certificate of conformity.
K07	Number of Cylinders	Enter the number of engine cylinders.
K08	Displacement(s)	Enter the engine displacement; if more than one displacement in a family, enter the largest displacement

		first starting at the left. Displacements in cubic inches are entered to the nearest whole cubic inch and displacements in liters are entered to the nearest tenth of a liter. The

Field	Description	Instructions
		decimal point must be included when entering displacement in liters.
K09	Fuel System Type	Enter "C" -carburetor and "F" -fuel injection systems.
K10	Method of Aspiration	Enter "N" -natural aspirated engines, and "T" -turbo-charged engines.
K11	Family Sales	Enter the engine family projected sales for the model year.
K12	Family Models	Enter the vehicle model(s) contained in the engine family. If more than one model, separate each model name with a semicolon (;).

Correcting The Family Information

When correcting or adding information to the family information sheet the first three fields (K01, K02, and K03) must be entered along with the field(s) being corrected or added. The complete field must be entered each time a correction or addition is made.

Test Information

Field	Description	Instructions
K101	Form	This entry has been completed.
K102	Process Code	Enter "N" -new submission or "C" -correction.

Field	Description	Instructions
K103	EPA Engine Family	Enter the EPA standardized engine family name.
K104	Data Set Number	The data set number is assigned by the manufacturer. This number is used to identify the test information submitted within an engine family and must have a different number assigned to each set of test information submitted.
K105	Vehicle Model	Enter the model the test vehicle represents.
K106	Displacement	Enter the test engine displacement in cubic inches or liters. Displacements in cubic inches are entered to the nearest whole cubic inch and displacements in liters

		are entered to the nearest tenth of a liter. The decimal point must be included when entering displacement in liters.
K107	Vehicle I.D. Number	Enter the test engine identification number.
K108	Emission Control System	Enter the types of emission control system the test engine represent. Use "EM" -engine modification, "EGR" -exhaust gas recirculation, "AIR" -air injection, and "CAT" - catalytic converter, etc. Start at the left and enter all emission control systems. If additional control system identifications are needed please contact EPA.

Field	Description	Instructions
K109	Engine Code	Enter the test engine code (calibration).
K110	Number Carburetors-Venturies	This field is to be completed only when the engine is carbureted. Starting at the left enter the number of carburetor(s) used on the engine and the number of venturies each carburetor has.
K111	Rated HP at Engine RPM	Enter starting at the left the rated horsepower and the revolutions per minute the rated

		horsepower occurs.
K112	Rated Torque at Engine RPM	Enter starting at the left the rated torque in foot pounds and the revolutions per minute the rated torque occurs.
K113	Data Type	Enter "C" -certification test data and "R" -running change test data.
K114	Equivalent Test Weight	Enter vehicle equivalent test weight in pounds.
K115	Actual Dyno HP	Enter actual dynamometer horse-power.
K116	Transmission Type	Enter vehicle transmission type "M-3" manual three speed, "A-3" automatic three speed, "L-4" automatic lockup four speed, etc.
K117	N/V Ratio	Enter the quotient of engine speed in revolutions per minute divided by vehicle speed in miles per hour measured in the highest (i.e., lowest numerical) transmission gear.

Records K118 through K132 are for OFFICIAL TEST RESULTS, DETERIORATION FACTORS, and CERTIFICATION LEVELS

OFFICIAL TEST RESULTS shall be reported to the number of decimal places contained in the applicable emission standards expressed to one additional significant figure. (Ref: 40 CFR 86.084-26(d)(2)(ii))

DETERIORATION FACTORS shall be reported to three places to the right of the decimal point.

CERTIFICATION LEVELS to compare with the emission standards shall be reported to the same number of significant figures as contained in the applicable standards. (Ref: 40 CFR 86.088-28(b)(4)(iv))

Correcting The Test Information

When correcting or adding information to the test information sheet the first four fields (K101, K102, K103 and K104) must be entered along with the field(s) being corrected or added. The complete field must be entered each time a correction or addition is made.

The 8 data sheets that follow this letter are stored as follows:

CD8810_1.PCX THROUGH CD8810_8.PCX